UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/552,715	04/19/2000	Seiji Umemoto	Q58947	3149

7590 04/21/2005

Shghrue Mion Zinn Macpeak & Seas PLLC
2100 Pennsylvania Avenue NW
Washington, DC 20037

EXAMINER	
PARKER, KENNETH	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 04/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/552,715	UMEMOTO, SEIJI	
	Examiner	Art Unit	
	Kenneth A. Parker	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-12 and 14-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-12 and 14-24* is/are rejected.

7)☒ Claim(s) *25 and 26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/5/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 12 and 14-16, 19-20, 22 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by DuNah et al 5420761.

Regarding claim 1, DuNah et al discloses in figure 3, a light pipe with an incident side,, an upper surface, a lower surface, and reflection layer 17 (integral in the sense that it is shown in direct contact) on the back, and a light source 28 is near the incident side as claimed.

The output means are repetition projections or prism like irregularities have slopes facing the incident side at an angle of 35-45 degrees (45-55 from applicants reference's perspective) and 1-10 degrees (the preferred ranges in column 2) at the other (the long side). The width (pitch) is 100-250 microns, which within the claimed range of 50-1500 microns. Almost all possible configurations meet the 10 degree slope in the preferred listings of the reference (the preferred configuration is 10 degrees; and employing the spacing and depth range of the reference takes the angle down to 5.7 degrees-, a narrower range than the instant invention, making the range limitations fully met by the reference.

Regarding the constraint that all of the prisms smaller angles are within 5 degrees on the whole device and 1 degree on neighboring prisms, the reference clearly shows the same pitch, which means the same angle, and therefore one of ordinary skill would have recognized that the angle is the same in the reference. Further the 5 degrees is greater than the largest angle in the references preferred embodiments.

The ratio of 8 to one or greater (claim 24) met by the indication of a depth of 1-10 microns and a spacing of 100-250 microns with an angle of 45-55 degrees, so all possible configurations meet 8 to one or greater.

As the projections point substantially at 45 degrees, with almost the exact same ranges of the claimed variables, and directs light substantially downward to a diffusely reflective reflector directly attached, it clearly meets the means plus function limitations.

Regarding claim 14, the pitch is fixed as the material is a solid.

The projected width (claim 15) of 40um is met as a 10 degree angle on 10 microns is met.

Regarding claim 16, one of ordinary skill would recognized that figure 3 shows the ridgelines running into the page (by the absence of the view of the side of the prisms), and hence parallel to the reference plane.

Regarding claim 19, the reflection layer 17 is integral in the sense that it is shown in direct contact with the guide as shown in figure 3.

Regarding claim 20, light is shown as scattering (fig 3).

Regarding claim 22, the 35 degrees is met in accordance with the discussion above.

Regarding claim 24, the 8 times is met in accordance with the discussion above.

Claim Rejections - 35 USC § 103

Claims 1-3, 5-7, 10-11, 21, 23 are rejected under 35 U.S.C. 103(a) as being obvious to one of ordinary skill over DuNah et al 5420761 in view of Kalamanash 5532852.

Regarding claim 1 DuNah et al does disclose a light pipe in figure 3, a light source 28 is near the incident side as claimed, a reflection layer 17 on the back. An LCD 23 is on the upper surface, ***however lacking explicit disclosure of at least one polarizing plate.***

The output means are repetition projections or prism like irregularities have slopes facing the incident side at an angle of 35-45 degrees (45-55 from applicants reference's perspective) and 1-10 degrees (the preferred ranges in column 2) at the other (the long side), in a light pipe with an upper, lower and incident side surface, the lower is reflective, and output means are on the upper surface.

Regarding the constraint that all of the prisms smaller angles are within 5 degrees on the whole device and 1 degree on neighboring prisms, the reference clearly shows the same pitch, which means the same angle, and therefore one of ordinary skill would have recognized that the angle is the same in the reference. Further the 5 degrees is greater than the largest angle in the references preferred embodiments.

Almost all possible configurations meet the 10 degree slope in the preferred listings of the reference (the preferred configuration is 10 degrees; and employing the spacing and depth range of the reference takes the angle down to 5.7 degrees-, a narrower range than the instant invention, making the range limitations fully met by the reference. The 45-55 is the same range as the 35-45 (claims 1, 7, 21) because they are referenced to different points (one is referenced to the normal, the other the surface). The width is 100-250 microns, which within the claimed range of 50-1500 microns. The ratio of 8 to one or greater (claims 23) met by the indication of a depth of 1-10 microns and a spacing of 100-250 microns with an angle of 45-55 degrees, so all possible configurations meet 8 to one or greater. As the projections point substantially at 45 degrees, with almost the exact same ranges of the claimed variables, and directs light substantially downward to a diffusely reflective reflector directly attached, it clearly meets the means plus function limitations.

Regarding the constraint that all of the prisms smaller angles are within 5 degrees on the whole device and 1 degree on neighboring prisms, the reference clearly shows the same pitch, which means the same angle, and therefore one of ordinary skill would have recognized that the angle is the same in the reference. Further the 5 degrees is greater than the largest angle in the references preferred embodiments.

As discussed above, lacking from the disclosure for claim 1 (and the claims dependent thereon) is the use of a polarizer, however a polarizer was part of the conventional LCD. Evidence that it was conventional is in the Patent and Trademark office classification definitions for class 349 search notes: "In this case, nominal cell

structure refers to a broad recitation of substrates, electrodes (or conductive plates or electrical excitation means), alignment layers, a seal, spacers, and polarizers ", and also in Kalamanash's description of the typical active matrix LCD. Realistically polarizers were required in all of the standard LCDs used in laptops, so their use was more than merely conventional- it was ubiquitous. Therefore one of ordinary skill would have found reason, suggestion and motivation to combine the teaching of Kalamanash to employ a polarizer to enable the use of standard (and therefore widely available) displays.

Regarding claim 2, the light can be turned off is inherent as anything can be turned off, even if it requires removing a power source.

Regarding claim 3, the angle is interpreted as running in the same direction as the reference plane, as both run into the page, and as discussed above, 8 times is met by the reference.

Regarding claim 5, the pitch is fixed as the material is a solid.

Regarding claim 6, the 40um projection is met as discussed above.

Regarding claim 7, where in a ridgeline is within 35 degrees to a reference plane of the incident side surface is met in accordance with the discussion above.

Regarding claim 10, the reflection layer 17 is integral in the sense that it is shown in direct contact with the guide as shown in figure 3.

Regarding claim 11, where the reflective layer diffuses as shown in figure 3.

Regarding claim 21, the short side at an angle of not less than 35 degree is shown as discussed above.

Regarding claim 23, 8 times as long is met as discussed above.

Claims 17-18 are rejected under 35 U.S.C. 103(a) as being obvious to one of ordinary skill over DuNah et al 5420761 in view of Ishii et al 5710856.

Regarding claim 17-18, the claims lack the list of materials (which includes silver). Silver was well known for low cost and low absorption (silver is expensive, but deposition keeps down the cost). This is discussed in column 2 of Ishii et al which indicates that silver be used as a thin film for the benefit of low cost and high reflection efficiency. Therefore one of ordinary skill would have found motivation, suggestion and reason to combine the silver taught by Ishii with the device of DuNah.

Lacking from the disclosure regarding claim 19 is the transmissivity of greater than 90% (not counting the absorption of the reflecting layer). Having the transmissivity of greater than 90% would have been obvious to one of ordinary skill as the transmissivity was one of the most well known things to have as close as possible to 100 as possible. This is shown in the discussion of Ishii et al (col 1), which discusses the problem of absorption and the desirability of increased efficiency.

Therefore one of ordinary skill would have found reason, motivation and suggestion to modify DuNah by the teaching of Ishii et al to employ as high a transmissivity as possible for the benefit of increased efficiency.

Claims 8-9 are rejected under 35 U.S.C. 103(a) as being obvious to one of ordinary skill over DuNah et al 5420761 in view of Kalamanash 5532852 as applied above, and further in view of Ishii et al et al 5710856.

The elements shown by DuNah are discussed above. Lacking from the disclosure regarding claim 8 is the transmissivity of greater than 90% (not counting the absorption of the reflecting layer). Having the transmissivity of greater than 90% would have been obvious to one of ordinary skill as the transmissivity was one of the most well known things to have as close as possible to 100 as possible. This is shown in the discussion of Ishii et al (col 1), which discusses the problem of absorption and the desirability of increased efficiency.

Therefore one of ordinary skill would have found reason, motivation and suggestion to modify DuNah by the teaching of Ishii et al to employ as high a transmissivity as possible for the benefit of increased efficiency.

Regarding claim 9, the claims lack the list of materials (which includes silver), and that the material diffuses light. Silver was well known for low cost and low absorption (silver is expensive, but deposition keeps down the cost). This is discussed in column 2 of Ishii et al which indicates that silver be used as a thin film (hence deposited and integral with the light guide) for the benefit of low cost and high reflection efficiency.

Therefore one of ordinary skill would have found motivation, suggestion and reason to combine the silver taught by Ishii with the device of DuNah.

Response to Arguments

The following assertions that items were conventional or well known have not been challenged and therefore are acquiesced to and taken the status of admitted prior art:

- Lacking from the disclosure is the use of a polarizer, however a polarizer was part of the conventional LCD, and would have been obvious to one of ordinary skill for that reason. Evidence that it was conventional is in the Patent and Trademark office classification definitions for class 349 search notes:"In this case, nominal cell structure refers to a broad recitation of substrates, electrodes (or conductive plates or electrical excitation means), alignment layers, a seal, spacers, and polarizers. ", and in Kalamanash's description of the typical active matrix LCD
- Having the transmissivity of greater than 90% would have been obvious to one of ordinary skill as the transmissivity was one of the most well known things to have as close as possible to 100 as possible, and having an the bumps be uniform was also a notoriously well known goal and obvious to one of ordinary skill for that reason.
- Silver and aluminum were the conventionally employed materials and would have been obvious to one of ordinary skill for that reasons mentioned above.

Allowable Subject Matter

Claims are 25-26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: None of the prior art taught or suggested a device as claimed with the rounded irregularities with a predetermined curvature.

Response to Arguments

Applicant's arguments filed have been fully considered but they are not persuasive, however the rejections have been slightly restructured for improved clarity .

Applicant hinges the argument on the use of the term "irregularity" to mean that the prism like projections are irregular. The argument is not persuasive as the interpretation is contrary to the common use in the art, contrary to the use in the specification and contrary to interpretations given over the prosecution history.. The customary use of surface irregularity is to mean a structure which varies from the surface, so it does not imply that one surface irregularity is irregular in some way from the next. In other words, one projection is called an "irregularity", even if there are no others, so there is no implication that one irregularity is not exactly like the next. This is clearly consistant with the specification, which indicates on page 8 "a repetitive structure of irregularities", which is shown in figure 2 which appears regular, and which on page

13 is indicated as having a pitch which may be irregular or regular, and even indicating that the shape may be irregular, implying it may not.

The term irregularity light guide is typically used to imply a bump or projection, a place that the surface is not planar. So an irregularity is a bump or indentation. Applicants assertion that each irregularity has to be different from the others are not agreed with, because the claim merely says irregularities, or bumps, not irregularities which differ from each other in some way. As evidence of the typical use of the term irregularity, the following references are cited.

Koike et al 5659410 .

"As shown in the drawing, two sides of the two side prism reflection element PF is formed thereon of repeated tilt surfaces H, H', J, J' constituting prism shaped irregularities."

Jannson et al 5838403

"the light beam emanating from each of the irregularities in the master diffuser 22 will expand less by the time it reaches the photosensitive medium 24."

Goto et al 5999685

Light reflection processing for irregularly reflecting light and uniformly diffusing the light (scattered point-shaped processing such as fine irregularities and screen process printing, for example) is performed on a surface opposite to the transparent lens portion 2,

Arai 6049649

n addition to the light scattering light guide plate described above, a light guide plate having a large number of fine irregularities provided on a surface of a transparent plate to restrain total reflection is well known as the light guide plate

with emitting directivity applicable to the surface light source device of side-light type. The irregularities may include numberless fine irregularities on the surface of the light guide plate itself or numberless fine particles fixed to a flat surface of a transparent plate with a light transmitting binder.

Yano et al 6507378

A reflection type liquid-crystal in which a light guide plate is in tight contact with a liquid-crystal display element having a reflecting layer through a bonding layer with refractive index in a range of from 1.40 to 1.55 and whole light transmittivity in a range of not less than 90%, the light guide plate being designed so that incident light from an incidence side surface is emitted from a lower surface through prismatic irregularities formed on an upper surface, and the light emitted from the lower surface takes maximum intensity at an angle of 30 degrees or less with respect to a normal to a plane of the lower surface, while maximum intensity of leakage light from the upper surface at that angle is not larger than 1/5 of the maximum intensity in the lower surface, and incident light from the lower surface is transmitted from the upper surface.

Yokoyama et al 6507379

Polarization conversion element 14 comprises a micro polarization beam splitter array 141 and quarter-wavelength film 142. Micro polarization beam splitter array 141 is constructed so an to form a plurality of microprisms 143 by mutual meshing together of two members with zigzag-shaped surface irregularities. Microprisms 143 are formed such that their boundary lines form a roof shape of 45.degree. angle with respect to the plans of the drawing. The boundary faces of microprisms 143 are formed by means of a dielectric multi-layer film structure or the like, so as to transmit light of specified polarization condition and to reflect light of polarization condition other
than this.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth A Parker whose telephone number is 571-272-2298. The examiner can normally be reached on M-F 10:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kenneth A Parker
Primary Examiner
Art Unit 2871